

sea-water is very different from that of ordinary caverns. While it may be possible that this modification of the darkness of the ocean abysses is due to phosphorescence of the animals themselves, it does not seem probable that it is wholly due to this cause.

The large size of the eggs is a marked feature in many of the deep-water Decapoda. The eggs of *Eupagurus politus* from 50 to 500 fathoms are more than eight times the volume of those of the closely allied and larger *E. bernhardus* from shallow water; and in *Sabinea princeps*, from 400 to 900 fathoms, they are more than fifteen times as large as in *S. septemcarinata* from 25 to 150 fathoms. The most remarkable cases are among the deep-water genera. *Galacantha rostrata* and *G. Bairdii*, from between 1000 and 1500 fathoms, have eggs 3 millim. in diameter in alcoholic specimens, while in the vastly larger lobster they are less than 2 millim. The largest Crustacean eggs known to me are those of *Parapsiphaë sulcatifrons*, a slender shrimp less than 3 inches long, taken between 1000 and 3000 fathoms. Alcoholic specimens of these eggs are fully 4 by 5 millim. in shorter and longer diameter, fully ten times the volume of the eggs of *Pasiphaë tarda* from 100 to 200 fathoms, more than 350 times the volume of those of a much larger shallow-water *Palæmon*, and each one more than a hundredth of the volume of the largest individual of the species. From the peculiar environment of deep-water species it seems probable that many of them pass through an abbreviated metamorphosis within the egg, like many freshwater and terrestrial species, and these large eggs are apparently adapted to produce young of large size, in an advanced stage of development, and specially fitted to live under conditions similar to those environing the adults.

XXIV.—Notes on Sponges, with Description of a new Species.

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THE following remarks are either based on specimens recently added to the collection in the British Museum, or suggested by the study of the collection.

MONACTINELLIDA.

Chalinidæ.

Cladochalina diffusa, n. sp.

Cladochalina diffusa, Ridley, Report on the Zoological Collections made during the Voyage of H.M.S. 'Alert,' p. 672, pl. xli. fig. D, d, d'.

Suberect, branching subdichotomously in one or more parallel

planes ; branches tortuous, more or less compressed, sometimes forming broad expansions terminated by subcylindrical prolongations, simple or branched ; greatest diameter of terminal branches about 10 millim. Surface either approximately even, or echinated by few and sharp vertical projections, 1-2 millim. high. Vents numerous, opening flush with surface, and entered at a slight depth by the openings of the excretory canals ; diameter 1-1.5 millim., scattered at intervals of 3-7 millim. over the anterior surface of the branches. Consistency in spirit firm, but compressible and elastic ; in dry state firm, but harsh to touch, and but slightly compressible and elastic : colour in spirit bright ochreous brown, in dry state pale grey. Main skeleton approximately rectangular in arrangement ; primary fibres about .4 millim. apart at surface, where they terminate vertically in the dermal reticulation, diameter about .1 to .14 millim. ; secondary fibres vertical to primaries, about .3 millim. apart, diameter .07 to .1 millim. ; fibres of both kinds consisting of a compact axial mass of spicules, and of a margin of transparent pale amber-yellow horny substance about .025 millim. broad. Dermal skeleton forming subquadrate meshes .18 to .36 millim. in diameter, formed of spiculo-fibres, which are usually devoid of any visible horny margin, and range in thickness from .025 to .1 millim. Sarcode pale amber-yellow, subtransparent. Spicules smooth acerate, slightly curved, tapering to sharp points from within about two diameters of ends, size .11 by .0063 millim.

Hab. Singapore, between tide-marks.

This species was obtained by H.M.S. 'Alert,' and figured in the 'Report' &c. (*l. c. supra*), but not described.

The largest specimen, which is dry, is very irregularly rooted, and near its base shows the palmate development of the stem and branches very strongly ; it measures 190 millim. ($7\frac{1}{2}$ inches) greatest lateral, and 95 millim. ($3\frac{3}{4}$ inches) in greatest present height ; its branches are almost smooth, but those of the younger spirit-specimen show the aculeation above described. Both specimens deviate from the erect habit in the turning of the branches outwards and to the sides soon after they are given off.

The fibre is stronger and stouter than in any *Cladochalina* with which I am acquainted, and gives the species the firmness of a *Pachychalina* ; in the tendency to become flattened it also resembles that genus.

The variation in the character of surface aculeation exhibited by this Chalinid is important and significant in relation to its value in classification.

Axinellidæ.

Echinodictyum mesenterinum.

Spongia mesenterina, Lamarck, Ann. Mus. Hist. Nat. xx. p. 444.

Echinonema vasiplicata, Carter, Ann. & Mag. Nat. Hist. 1832, ix. p. 114.

This fine species has been described under the above two names. I have already stated (Report on the Zoological Collections made during the Voyage of H.M.S. 'Alert: London, 1884, p. 454) that Mr. Carter's species is referable to *Echinodictyum*, mihi. Examination of a specimen in the Museum at the Jardin des Plantes, Paris, which agrees with Lamarck's description, has shown me that that species is identical with the former.

Suberitidæ.

For the view that the Suberitidæ are really Monactinellid and Monaxonid, derived from a Diactinellid type, and not reduced Tetractinellids, evidence is afforded by the heads of the spicules of the species described below. In those heads which (as in many other species) exhibit a small terminal rounded process or knob, the central canal shows a small inflation near the centre of the larger division of the head, and a fine undilated prolongation in the direction of (but scarcely extending into) the small process, apparently indicating that the spicule was originally prolonged on both sides of the present head, the small terminal knob of the head and the fine prolongation of the central canal being rudiments of the second ray. An additional argument in favour of this view is the fact that the projection and its corresponding section of central canal occur in young spicules; and tend to be lost in adult examples.

Suberites massa, Schmidt, var.

As the original form of this species has (like, indeed, most known species of *Suberites*) never been fully characterized, I think it well to describe some interesting specimens from Mauritius, which differ from the originals only in their external form.

Sponge massive, consisting of vertical convolutions or sinuous laminae, about 45 millim. ($1\frac{3}{4}$ inches) high, and 10 millim. thick above, appressed towards each other, dividing and uniting with each other; they are rounded above and rise to approximately the same height. General appearance that of the human cerebrum. Vents scattered, subcircular, about 1 millim. in diameter, placed low down on the sides of the convolutions at some distance below the top of the sponge.

Colour, in dry state, orange-brown. Skeleton—composed of long, imperfectly separated bands of the skeleton-spicule, massed closely together and parallel in direction, extending from the base towards the apex of the lobes composing the sponge, beneath the layer which forms the immediate surface. Dermal layer consisting of short spicular columns, $\cdot 4$ – $\cdot 6$ millim. in height, arising vertically or obliquely to the surface, where the spicules spread out so as to form, by the lateral divergence of their apices, brushes, which are in contact with each other laterally; between the bases of these brushes are placed the chones of the inhalent canal-system. Spicules—spinulate, smooth, head oval to globular, a small basal rounded prolongation in nearly all spicules, except those fully adult, where it appears usually to be wanting; neck moderately distinct; shaft normally straight, tapering to a sharp point from near middle: size—main skeleton $\cdot 8$ millim. by $\cdot 019$ millim. (both head and shaft), dermal skeleton $\cdot 6$ by $\cdot 013$ (head), $\cdot 0095$ millim. (shaft). Internal soft tissues transparent and pale amber-yellow in the dried state.

Hab. Adriatic (*Schmidt*); Mauritius (*coll. Mus. Brit.*).

This form agrees in every essential particular of its minute structure with Adriatic specimens.

Mr. Carter (*Ann. & Mag. Nat. Hist. ser. 5, ix. 1882, p. 351*) records from Mauritius a *Suberites*, as “massive, growing into short branches on the surface; colour ochre-yellow.” He says it is undescribed, but shortly afterwards states that it will probably be found to be identical with the above species.

The laminae in the present specimens appear to be more or less distinct from the base upwards. The total height of the sponge is about 60 millim. ($2\frac{1}{2}$ inches); horizontal extent of the largest specimen (apparently not quite perfect) 110 by 78 millim. ($4\frac{1}{2}$ by 3 inches).

Since the above description and remarks were written, another specimen of this species has been received, also from Mauritius, which is composed of similar vertical laminae; these, however, instead of being closely appressed by their sides, are distinct from each other, with the exception of junctions caused by uniting trabeculae of sponge-substance; thus the common portion of the sponge forms a honeycombed mass with wide fenestrae; above, the vertical plates project freely in the form of flat plates, sometimes of considerable extent, or of narrow finger-like lobes, closely resembling those of the Adriatic specimens of the species now in the British Museum. In this second Mauritius specimen the subglobose form of the head of the spinulate is the commonest, and the horizontal

bundles of spiculo-fibre are not so well marked as in the cerebriiform variety.

Spirastrella pulvinata.

Hymeniacidon pulvinata, Bowerbank, P. Z. S. 1872, p. 126.

As the spiculation and other characters of this species agree with those of Schmidt's genus *Spirastrella*, I have labelled the magnificent specimens on which the species is based, now in the British Museum, as above.

TETRACTINELLI DA.

Corallistes parasitica.

Arabescula parasitica, Carter, Ann. & Mag. Nat. Hist. 1873, xii. p. 464.

An immense specimen, about 19 inches wide, 11 inches high, was acquired for the National Collection from Mauritius some little time since. It has the general form of a single somewhat folded cabbage-leaf. It is attached by a short distinct submedian stem, 35 millim. high, 75 millim. wide across the front, 35 millim. from back to front; the frond itself ranges from 10 to 15 millim. in thickness. When perfect, the greater part of the margin appears to have been sharp, and uninjured remains of it have a pinched-up appearance.

When attached, the frond probably was suberect, the upper half being recurved so as to form an angle of about 60° with the basal portion. The whole of that side which thus becomes the upper side is beset with small conical vents, about 1 millim. high, .6-1 millim. wide at their mouth, distributed at intervals of from 2 to 4 millim.; in most cases they may be seen to be entered, at about 1 millim. below their margins, by a number of secondary excretory canals. The opposite surface of the frond is covered with similar but smaller openings, slightly prominent, about .3 millim. wide at the mouth, arranged in sinuous series, about 1 millim. apart, the openings of those of the same series being almost in contact with each other. The external and minute characters of this fine species, now that they are fully known, agree well with those of *Corallistes*. To Carter's account of the spicules may be added that a flesh-spicule, bow-shaped or somewhat sinuous, minutely roughened, and measuring .019 millim. long by .0017 millim. thick, occurs very abundantly in the dermis.